are stored in the other of the first memory and the second memory, updates the stored information in the third memory to cause the processor to execute the downloadable process control program instructions stored in the other of the first memory and the second memory while the processor is disabled, and reenables the processor to execute the downloadable process control program instructions stored in the other of the first memory and the second memory after the third memory is updated.

REMARKS

Applicants respectfully request reconsideration of this application in view of the present amendments and the following remarks. Claims 1-36 are pending and at issue in this case, with claims 1, 11, 17, 23 and 31 being independent claims.

Applicants respectfully traverse the rejection of claims 1-5, 9-13, 17-19, 23-26 as anticipated by Burns et al. (U.S. Patent. No. 5,970,430), and the rejection of claims 6 and 27 as unpatentable over Burns et al. in view of Schrier et al. (U.S. Patent No. 6,055,633). Reconsideration in view of the amendments above and remarks below is respectfully requested.

Independent claims 1, 11, 17, 23 and 31 are amended to more clearly recite that process control program instructions are downloaded to field devices using standard communication protocols during operation of the process control network while the field devices are enabled to perform process control. Dependent claims 2-8, 12-16, 18-23, 25-29 and 34-36 are amended for consistency with the amendments to the corresponding independent claims. The apparatus and methods recited in the claims overcome the prior art processes wherein process control systems and field devices are partially or completely taken out of service while process control program instructions are downloaded to field devices. (Specification, page 6, lines 11-29; *see also* Schrier et al., col. 2, lines 31-40 and col. 4, lines 1-7 (describing a download process wherein field devices stop normal data processing activities prior to downloading new programming instructions over the network)).

The references applied by the Examiner neither disclose nor suggest downloading process control program instructions to field devices during operation of the process control network while the field devices are enabled to perform process control. The Burns et al. reference discloses a method of and device for performing device and process diagnostics on

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and from a particular process control device within a process control network. (Burns et al., col. 4, lines 61-64). Device and process diagnostics software cause the tested field devices to operate under the control of the test procedure for evaluation of the performance of the field devices, and Burns et al. does not appear to disclose or suggest that the diagnostics software effects process control performed by the field devices. The diagnostics software and procedures are not process control program instructions as recited in the claims as amended. Further, Burns et al. does not appear to disclose or suggest that the diagnostics software and procedures are types of software for which field devices must be disabled from performing process control during a software download and upgrade, such as, for example, control applications, control modules, operating system software and the like. Therefore, because Burns et al. appears to neither disclose nor suggest downloading any software for which field devices must be disabled from performing process control, let alone process control program instructions as recited in the claims, Burns et al. alone does not anticipate or render obvious claims 1-36.

Schreir et al. does not provide the missing disclosure or suggestion of a method and apparatus for downloading process control program instructions to field devices that are enabled to perform process control, and in fact teaches away from such methods and apparatus. As previously discussed, Schrier et al. discloses a download process wherein field devices in a process control network stop normal data processing activities prior to downloading new programming instructions over the network. Schrier et al., col. 2, lines 31-40 and col. 4, lines 1-7. Therefore, Schrier et al. teaches away from downloading any software to the field devices, let alone downloading process control program instructions to field devices, while the field devices are enabled to perform process control. It follows, therefore, in the opinion of the applicants that the applied references neither anticipate nor render obvious claims 1-36. *See In re Oetiker*, 24 U.S.P.Q.2d 1443, 1446 (Fed. Cir. 1992); *Ex parte Clapp* , 227 U.S.P.Q. 972, 973 (Bd. Pat. App. 1985) (the prior art must make a suggestion of or provide an incentive for the claimed combination of elements in order to establish a *prima facie* case of obviousness). Because the applied references do not appear to teach or suggest downloading process control program instructions to field devices during the operation of a process control network while the field devices are enabled to perform process control, and in fact teach away from downloading software to field devices while the field devices are enabled to perform process control, the applicants respectfully submit that claims

1-36 are now in condition for allowance, and the applicants respectfully request allowance of these claims at the Examiner's earliest convenience.

For at least the foregoing reasons, reconsideration and withdrawal of the rejection of the claims and allowance of the currently pending claims are respectfully requested. Should the Examiner wish to discuss the foregoing or any matter of form in an effort to advance this application towards allowance, she is urged to telephone the undersigned at the indicated number.

Respectfully submitted,

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MARKED-UP VERSION OF CLAIMS SHOWING CHANGES BEING MADE

1.   (Amended)   A method of reprogramming a field device in a process control network having a plurality of devices which are communicatively linked on a bus and which use a standard communication protocol to perform process control functions, the method comprising the steps of:

downloading process control program instructions from a host device to one of the field devices using the standard communication protocol during operation of the of the process control network while the one of the field devices is enabled to perform process control;

storing the downloaded process control program instructions in the field device; and

causing the field device to execute the downloaded process control program instructions to perform process control.

2.   (Amended)   A method of reprogramming a field device in a process control network according to claim 1, wherein the downloading step comprises the step of transmitting the process control program [programming] instructions from the host device to the one of the field devices using unscheduled queued communications.

3.   (Amended)   A method of reprogramming a field device in a process control network according to claim 2, wherein the downloading step comprises the step of transmitting the process control program [programming] instructions from the host device to the one of the field devices using a plurality of unscheduled queued communications.

4.   (Amended)   A method of reprogramming a field device in a process control network according to claim 1, wherein the one of the field devices has a first memory with stored process control program instructions and a second memory, wherein said storing step comprises the step of storing the downloaded process control program instructions in the second memory while the one of the field devices is capable of executing the stored process control program instructions to perform process control.

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5.   (Amended)   A method of reprogramming a field device in a process control network according to claim 4, wherein the causing step comprises the step of copying the downloaded process control program instructions from the second memory to the first memory.

6.   (Amended)   A method of reprogramming a field device in a process control network according to claim 4, wherein the causing step comprises the step of redirecting the one of the field devices from executing the stored process control program instructions in the first memory to executing the downloaded process control program instructions in the second memory.

7.   (Amended)   A method of reprogramming a field device in a process control network according to claim 4, wherein the causing step comprises the steps of:

        ceasing the execution of the stored process control program instructions in the first memory;

        copying the downloaded process control program instructions from the second memory to the first memory;

        initiating the execution of the downloaded process control program instructions in the first memory.

8.   (Amended)   A method of reprogramming a field device in a process control network according to claim 4, wherein the causing step comprises the steps of:

        ceasing the execution of the stored process control program instructions in the first memory;

        redirecting the field device to execute the downloaded process control program instructions in the second memory;

        initiating the execution of the downloaded process control program instructions in the second memory.

11. (Amended) A system for reprogramming a field device in a process control network having a plurality of field devices communicatively linked over a bus, wherein each of the field devices is capable of communicating on the bus using a standard communications protocol during operation of the process control network, the system comprising:

a first device that generates downloadable process control program instructions and that transmits the downloadable process control program instructions over the bus using the standard communication protocol; and

a second device capable of receiving the downloadable process control program instructions transmitted over the bus, the second device comprising:

a processor adapted to execute a set of process control program instructions stored in the second device;

a first memory adapted to store a first set of process control program instructions that may be executed by the processor; and

a second memory adapted to store the downloadable process control program instructions transmitted over the bus;

wherein the first device transmits the downloadable process control program instructions to the second device and the second device receives the downloadable process control program instructions and stores the downloadable process control program instructions in the second memory during operation of the process control network while the second device is enabled to perform process control.

12. (Amended) A system for reprogramming a field device according to claim 11, wherein the standard communication protocol includes scheduled and unscheduled communications and the first device transmits the downloadable process control program instructions to the second device using unscheduled communications.

13. (Amended) A system for reprogramming a field device according to claim 11, wherein the standard communication protocol includes concurrent analog and digital communications and the first device transmits the downloadable process control program instructions to the second device using digital communications.

14.   (Amended)   A system for reprogramming a field device according to claim 11, wherein the first memory is a non-volatile memory and the second device stores the downloadable process control program instructions in the second memory while the processor is enabled to execute process control program instructions stored in the first memory to perform process control, and wherein the second device includes a transfer unit that disables the processor from executing process control program instructions stored in the first memory after the downloadable process control program instructions are stored in the second memory, that copies the downloadable process control program instructions from the second memory to the non-volatile memory of the first memory while the processor is disabled, and that reenables the processor to execute the downloadable process control program instructions stored in the first memory after the downloadable process control program instructions are copied.

15.   (Amended)   A system for reprogramming a field devices according to claim 11, wherein the first memory is a non-volatile memory adapted to store the downloadable process control program instructions, the second memory is a non-volatile memory adapted to store process control program instructions that may be executed by the processor, the second device includes a transfer unit adapted to store information causing the processor to execute the process control program instructions stored in one of the first memory and the second memory, and wherein the transfer unit stores the downloadable process control program instructions in the other of the first memory and the second memory while the processor is enabled to execute process control program instructions stored in the one of the first memory and the second memory to perform process control, disables the processor from executing process control program instructions stored in the one of the first memory and the second memory after the downloadable process control program instructions are stored in the other of the first memory and the second memory, updates the stored information to cause the processor to execute the downloadable process control program instructions stored in the other of the first memory and the second memory while the processor is disabled, and reenables the processor to execute the downloadable process control program instructions stored in the other of the first memory and the second memory.

16.   (Amended)   A system for reprogramming a field devices according to claim 11, wherein the second device further comprises a non-volatile memory having a first portion containing the first memory, a second portion containing the second memory, the first memory and the second memory being adapted to store <u>process control</u> program instructions that may be executed by the processor and downloadable <u>process control</u> program instructions received in the input signal, and a transfer unit having a third memory adapted to store information causing the processor to execute the <u>process control</u> program instructions stored in one of the first memory and the second memory, and wherein the transfer unit stores the downloadable <u>process control</u> program instructions in the other of the first memory and the second memory while the processor is enabled to execute <u>process control</u> program instructions stored in the one of the first memory and the second memory to perform process control, disables the processor from executing <u>process control</u> program instructions stored in the one of the first memory and the second memory after the downloadable <u>process control</u> program instructions are stored in the other of the first memory and the second memory, updates the stored information in the third memory to cause the processor to execute the downloadable <u>process control</u> program instructions stored in the other of the first memory and the second memory while the processor is disabled, and reenables the processor to execute the downloadable <u>process control</u> program instructions stored in the other of the first memory and the second memory after the third memory is updated.

17.   (Amended)   A reprogrammable field device capable of being used in a process control network having a plurality of devices communicatively coupled to a bus, wherein each of the devices is capable of communicating on the bus using a standard communications protocol, and wherein a host device is capable of generating input signals including downloadable <u>process control</u> program instructions and transmitting the input signals to the reprogrammable field device over the bus during operation of the process control network <u>while the reprogrammable field device is enabled to perform process control</u>, the reprogrammable field device comprising:

a processor adapted to execute a set of <u>process control</u> program instructions stored in the reprogrammable field device;

a first memory adapted to store a first set of <u>process control</u> program instructions that may be executed by the processor; and

a second memory adapted to store the downloadable <u>process control</u> program instructions transmitted over the bus;

wherein the reprogrammable field device receives the downloadable <u>process control</u> program instructions and stores the downloadable <u>process control</u> program instructions in the second memory during operation of the process control network <u>while the reprogrammable field device is enabled to perform process control</u>.

18.　　(Amended)　　A reprogrammable field device according to claim 17, wherein the standard communication protocol includes scheduled and unscheduled communications and the host device transmits the downloadable <u>process control</u> program instructions to the reprogrammable field device using unscheduled communications.

19.　　(Amended)　　A reprogrammable field device according to claim 17, wherein the standard communication protocol includes concurrent analog and digital communications and the host device transmits the downloadable <u>process control</u> program instructions to the reprogrammable field device using digital communications.

20.　　(Amended)　　A reprogrammable field device according to claim 17, wherein the first memory is a non-volatile memory and the reprogrammable field device stores the downloadable <u>process control</u> program instructions in the second memory while the processor is enabled to execute <u>process control</u> program instructions stored in the first memory to perform process control, and wherein the reprogrammable field device further comprises a transfer unit that disables the processor from executing <u>process control</u> program instructions stored in the first memory after the downloadable <u>process control</u> program instructions are stored in the second memory, copies the downloadable <u>process control</u> program instructions from the second memory to the non-volatile memory of the first memory while the processor is disabled, and reenables the processor to execute the downloadable <u>process control</u> program instructions stored in the first memory after the downloadable <u>process control</u> program instructions are copied.

21.   (Amended)   A reprogrammable field device according to claim 17, wherein the first memory is a non-volatile memory adapted to store the downloadable process control program instructions received in the input signals, the second memory is a non-volatile memory adapted to store process control program instructions that may be executed by the processor, and the reprogrammable field device further comprises a transfer unit having a third memory adapted to store information causing the processor to execute the process control program instructions stored in one of the first memory and the second memory, and wherein the transfer unit stores the downloadable process control program instructions in the other of the first memory and the second memory while the processor is enabled to execute process control program instructions stored in the one of the first memory and the second memory to perform process control, disables the processor from executing process control program instructions stored in the one of the first memory and the second memory after the downloadable process control program instructions are stored in the other of the first memory and the second memory, updates the stored information in the third memory to cause the processor to execute the downloadable process control program instructions stored in the other of the first memory and the second memory while the processor is disabled, and reenables the processor to execute the downloadable process control program instructions stored in the other of the first memory and the second memory after the third memory is updated.

22.   (Amended)   A reprogrammable field device according to claim 17, further comprising:

a non-volatile memory having a first portion containing the first memory and a second portion containing the second memory, the first memory and the second memory being adapted to store process control program instructions that may be executed by the processor and downloadable process control program instructions received in the input signal; and

a transfer unit adapted to store information causing the processor to execute the process control program instructions stored in one of the first memory and the second memory,

wherein the transfer unit stores the downloadable process control program instructions in the other of the first memory and the second memory while the

processor is enabled to execute <u>process control</u> program instructions stored in the one of the first memory and the second memory to perform process control, disables the processor from executing <u>process control</u> program instructions stored in the one of the first memory and the second memory after the downloadable <u>process control</u> program instructions are stored in the other of the first memory and the second memory, updates the stored information to cause the processor to execute the downloadable <u>process control</u> program instructions stored in the other of the first memory and the second memory while the processor is disabled, and reenables the processor to execute the downloadable <u>process control</u> program instructions stored in the other of the first memory and the second memory after the third memory is updated.

23.   (Amended)   A method of reprogramming a field device in a process control network having a plurality of devices which are communicatively linked on a bus to perform process control functions, the method comprising the steps of:

downloading <u>process control</u> program instructions from a host device to one of the field devices wherein the host device divides the <u>process control</u> program instructions into a plurality of data packets that are downloaded to the one of the field devices over time <u>while the one of the field devices is enabled to perform process control</u>;

reassembling the downloaded data packets into the <u>process control</u> program instructions in the field device;

storing the downloaded <u>process control</u> program instructions in the field device; and

causing the field device to execute the downloaded <u>process control</u> program instructions.

25.   (Amended)   A method of reprogramming a field device in a process control network according to claim 23, wherein the one of the field devices has a first memory with stored <u>process control</u> program instructions and a second memory, wherein said storing step comprises the step of storing the downloaded <u>process control</u> program instructions in the second memory while the one of the field devices is capable of executing the stored <u>process control</u> program instructions to perform process control.

26.   (Amended)   A method of reprogramming a field device in a process control network according to claim 25, wherein the causing step comprises the step of copying the downloaded <u>process control</u> program instructions from the second memory to the first memory.

27.   (Amended)   A method of reprogramming a field device in a process control network according to claim 25, wherein the causing step comprises the step of redirecting the one of the field devices from executing the stored <u>process control</u> program instructions in the first memory to executing the downloaded <u>process control</u> program instructions in the second memory.

28.   (Amended)   A method of reprogramming a field device in a process control network according to claim 25, wherein the causing step comprises the steps of:

ceasing the execution of the stored <u>process control</u> program instructions in the first memory;

copying the downloaded <u>process control</u> program instructions from the second memory to the first memory;

initiating the execution of the downloaded <u>process control</u> program instructions in the first memory.

29.   (Amended)   A method of reprogramming a field device in a process control network according to claim 25, wherein the causing step comprises the steps of:

ceasing the execution of the stored <u>process control</u> program instructions in the first memory;

redirecting the field device to execute the downloaded <u>process control</u> program instructions in the second memory;

initiating the execution of the downloaded <u>process control</u> program instructions in the second memory.

31.   (Amended)   A system for reprogramming a field device in a process control network having a plurality of field devices communicatively linked over a bus, wherein each of the field devices is capable of communicating on the bus during operation of the process control network, the system comprising:

a first device that divides downloadable process control program instructions into a plurality of data packets and that transmits the data packets over the bus; and

a second device capable of receiving the data packets transmitted over the bus and reassembling the data packets into the downloadable process control program instructions, the second device comprising:

a processor adapted to execute a set of process control program instructions stored in the second device;

a first memory adapted to store a first set of process control program instructions that may be executed by the processor; and

a second memory adapted to store the downloadable process control program instructions transmitted over the bus;

wherein the first device transmits the data packets to the second device and the second device receives the data packets, reassembles the data packets into the downloadable process control program instructions, and stores the process control program instructions in the second memory during operation of the process control network while the second device is enabled to perform process control.

34.   (Amended)   A system for reprogramming a field device according to claim 31, wherein the first memory is a non-volatile memory and the second device stores the downloadable process control program instructions in the second memory while the processor is enabled to execute process control program instructions stored in the first memory to perform process control, and wherein the second device includes a transfer unit that disables the processor from executing process control program instructions stored in the first memory after the downloadable process control program instructions are stored in the second memory, that copies the downloadable process control program instructions from the second memory to the non-volatile memory of the first memory while the processor is disabled, and that reenables the processor to execute the downloadable process control

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program instructions stored in the first memory after the downloadable process control program instructions are copied.

35.   (Amended)   A system for reprogramming a field devices according to claim 31, wherein the first memory is a non-volatile memory adapted to store the downloadable process control program instructions, the second memory is a non-volatile memory adapted to store process control program instructions that may be executed by the processor, the second device includes a transfer unit adapted to store information causing the processor to execute the process control program instructions stored in one of the first memory and the second memory, and wherein the transfer unit stores the downloadable process control program instructions in the other of the first memory and the second memory while the processor is enabled to execute process control program instructions stored in the one of the first memory and the second memory to perform process control, disables the processor from executing process control program instructions stored in the one of the first memory and the second memory after the downloadable process control program instructions are stored in the other of the first memory and the second memory, updates the stored information to cause the processor to execute the downloadable process control program instructions stored in the other of the first memory and the second memory while the processor is disabled, and reenables the processor to execute the downloadable process control program instructions stored in the other of the first memory and the second memory.

36.   (Amended)   A system for reprogramming a field devices according to claim 31, wherein the second device further comprises a non-volatile memory having a first portion containing the first memory, a second portion containing the second memory, the first memory and the second memory being adapted to store process control program instructions that may be executed by the processor and downloadable process control program instructions received in the input signal, and a transfer unit having a third memory adapted to store information causing the processor to execute the process control program instructions stored in one of the first memory and the second memory, and wherein the transfer unit stores the downloadable process control program instructions in the other of the first memory and the second memory while the processor is enabled to execute process control program instructions stored in the one of the first memory and the second memory to perform process

control, disables the processor from executing <u>process control</u> program instructions stored in the one of the first memory and the second memory after the downloadable <u>process control</u> program instructions are stored in the other of the first memory and the second memory, updates the stored information in the third memory to cause the processor to execute the downloadable <u>process control</u> program instructions stored in the other of the first memory and the second memory while the processor is disabled, and reenables the processor to execute the downloadable <u>process control</u> program instructions stored in the other of the first memory and the second memory after the third memory is updated.